The MONTHLY REVIEW

Published Monthly by the

American Electro[illegible] Society

A SOCIETY FOR THE ADV[illegible]NT

OF THE

SCIENCE OF ELECTROP[illegible]GY

DECEMBER, 19[illegible]

Entered as second class matter [illegible] Post Office [illegible] September 1, 1920, under act of August 24, 1912.

Acceptance for mailing at special rate of [illegible] section 1103, Act of February 28, 1925, authorized [illegible]

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MONTHLY REVIEW

Published by the

American Electro-Platers Society

Publication and Editorial Office

90 Maynard St., Springfield, Mass.

VOL. XVIII DECEMBER, 1931 No. 12

A Merry, Merry Christmas

Is our wish for you

And 366 days of happiness and

Prosperity for nineteen thirty-two

Fellow members:

I am sending you a personal appeal to come to the aid of the Research Committee. On November 1st the committee funds amounted to $2,400, but on October 30th the Union Trust Company of Dayton, Ohio, in which the funds were deposited, stopped payments on all accounts and placed itself in the control of the State Banking Commission. According to reports, the depositors will receive their money in due course of time. We are all agreed that the research work already accomplished has more than repaid its cost and we would not want to discontinue the worthwhile activity. However, in order to continue with the research work the committee must have the necessary funds.

In the last campaign for funds the Society contributed $1,350. Subscriptions from other sources amounted to $3,650. The U. S. government contributed at least $5,000 by supplying laboratories, materials, etc. This shows that in the past our Society has contributed a very small portion of the funds used in carrying on the research work. It has been the custom for each branch to subscribe $50 per year to the fund. At the last convention it was voted that each member be asked to contribute $2.00 per year. Due to our present predicament, I am appealing to each member to raise the $2.00 per member subscription and send it to the Research Committee instead of the usual $50 subscription. The method of raising the money is left to the decision of each branch. The $2.00 individual subscription will bring the contribution of the Society up to $3,000, whereas when each branch contributed the flat sum of $50 the total amount was only $1350.

In addition to this may I ask for loans of any amount of money to the Research Committee from all who can do so. These loans will be repaid as soon as the bank returns our funds.

I am not unmindful of the fact that you have been besieged for financial assistance from many other sources; and I am aware that due to present business conditions some members will be unable to contribute. However, I am sure that the majority can and will help. Urge your branch to take immediate action and send the money contributed ($2.00 per member) to:

MR. WALTER FRAINE, 507 Grand Avenue, Dayton, Ohio.

Sincerely yours,

PHILIP SIEVERING, *Supreme President.*

Value to Our Society of the Associate Member

This Society has three classes of members, namely: active, honorary and associate. There must have been some good reason for making this classification, so let us look into the matter and see just why the differentiation. The active and honorary class are more or less self-explanatory, but why and what is the associate class? We see in the constitution that associate members consist of chemists who have been actively engaged in electro-deposition of metals in a commercial plating department for a period of three years, and members of commercial concerns dealing directly in electroplating supplies who can offer the same qualifications as are required of an active member or of a chemist. Associate members shall have all the privileges of an active member except being eligible to any office other than that of the Board of Managers. In other words, associate members are persons whose interest lies in the plating field but who themselves are not actively engaged in practical commercial plating.

Now when a person joins a society he does so because he is going to get something out of his affiliation, whether it be for the educational knowledge, personal contact with other persons of like interests, or the distinction to be gained in just being a member of the society. When a society accepts a man as a member it does so for the same reasons. Some men will bring knowledge of a highly technical nature, others will bring hints, shortcuts and ideas of great value to the practical man, and still others will bring distinction and raise the esteem of the society in other people's eyes.

Thus it can be seen why the associate membership is to be encouraged, consisting as it does of the highly trained chemist and technical man, and the practical man. The chemist is of great value because of the papers he may present to the society along the line of research, theory, etc., or in general the dissemination of his scientific knowledge to the practical man. And, of course, the technical man derives great benefit by coming in contact with the practical man and learning of his problems, the solution of which can then be worked out so as to be of greater value to all concerned. The chemist and technical man have also proven of great value because they have made the Society an authority on the subject, something which would have been impossible without their scientific backing.

The supply house man traveling from factory to factory is bound to pick up new ideas, developments and different methods of procedure, and as he has been a practical plater he can understand them and tell them to someone else, so that he becomes one of our best sources from which to get an idea as to how the other fellow is doing it. Many times he will correlate his observations in the form of a paper for the Society, which proves of great value to everyone, as it tends to keep the advancement of the art at an even pace throughout the country. He is also a good advertiser for the Society, for in going from place to place he carries the report of the progress made by the Society and arouses the interest of other people in the Society, and so naturally the Society and what it stands for become better known. Let us therefore encourage this class of members, as their worth has already been proven.

DEGREASING METALS BY VAPOR PROCESS

By E. V. D. Wallace

Read at Rochester Convention, 1931

In case you do not know, you will find it out during the discussion which may follow this paper, and that is, I am not an electroplater. My knowledge of the electroplating industry has been gained in the past two years as a casual observer of a large number of plants, and also from conversations I have had with the various operators. Therefore, it is merely a superficial knowledge, and not a technical one.

In a survey made of a large number of metal finishing establishments about two years ago, the electroplating industry stood out most prominently in my mind as the one in which very little progress had been made, up to a short time ago. To me it seemed that the process was pretty well fixed and it had an air of mystery about it. The various methods in use were handed down from father to son, until you could almost read, when you went into an electroplating room, "Keep your hands off."

It is very evident now, however, in going into some of the larger and more modern plants, particularly those which are controlled by a graduate chemist, or possibly a younger man, that there are signs of improvement, and I believe that today the electroplating field is on the threshold of modern business and technical methods.

My observations were entirely those of an unbiased person, but in talking with the various men interested in the metal cleaning

industry, it was generally agreed by all of them that the necessity for removing grease and oil from metals prior to any finishing method was paramount, and unless this could be done satisfactorily it was useless to expect a decent job of metal finishing. This led us to believe that our vapor degreasing process would be the key to better finishing, and so reported to our company, which was interested in putting out the Carrier Vapor Degreasing Process.

Origin of the Vapor Process

Some years ago, when the automobile industry attempted to invade the European market, most of the automobile parts, such as bodies, fenders, etc., were shipped to the foreign market thoroughly slushed in oil. It then became a difficult proposition to remove this oil and grease from these parts, prior to enameling. It was through the ingenuity of the Carrier, Ltd., engineers that a method of putting these parts through vapor, created by the boiling or evaporation of chlorinated solvents, by which this grease and oil could be removed most effectively without a tremendous amount of hand scrubbing with gasoline or other solvents. Several of these installations were made in England, Belgium and Brazil, and worked out so satisfactorily that it was thought advisable to bring the proposition to this country and see if it could not be developed to a point where it would be acceptable to the metal cleaning industry here.

Chlorinated solvents are used quite extensively in Europe as a means of removing grease and oil, but they are used in the liquid form, just as we use gasoline, naphtha, spirits and lacquer thinners. Most of these solvents are non-inflammable and non-explosive, and are a by-product instead of being a manufactured product as in this country. They are cheaper to use there, in view of the fact that they are a by-product, and therefore gasoline and naphtha are not used to such an extent.

The vapor process had never been used in this country before, although it was generally known among chemists for the past hundred years that the vapor from chlorinated solvents was most effective in the removal of grease and oil from metal. Therefore, it was necessary for us to put the problem in our own laboratory and work out the best means of evaporating the liquid, controlling the vapor, and calculating the various ratios necessary to make

the proposition the most attractive one for the manufacturers here, it being borne in mind that we had our eye on the automobile manufacturing business, as that was where our experience lay abroad.

During the course of our development work we hit upon a very clever idea of controlling this vapor by means of condenser coils. Since the vapor was several times heavier than air, it would lie in a tank the same as water.

We found, from our previous survey of the metal industry, that there is a very large field throughout the country for the use of a positive grease remover, and this stimulated our efforts toward the development of our present Carrier vapor dip tank.

Description of the Vapor Degreasing Process

This consists of boiling or evaporating in a tank, or container, a solvent for grease and oil in which the metal or material to be degreased is immersed in the vapor arising from this boiling liquid. As the metal is colder than the vapor, the vapor immediately condenses upon the surface, absorbing the grease and oil and running off, carrying with it the dissolved grease and a considerable amount of the insoluble material. The key to this method is that the degreased surface does not come in contact with the oil or grease when being removed from the tank or container. In other words, only the pure solvents ever come in contact with the degreased surface and, therefore, this method is a positive one and not at all dependent upon the operator.

In the design of this equipment, it became necessary to control the surplus vapor from rising above the top of the tank, and this was done by means of condenser coils placed at the vapor level, through which cold water ran and over which the vapor would condense and flow back to the liquid well. The means of evaporation is simple, and can be accomplished by either steam or electricity and, in some cases, gas, providing the diffusion of the vapor does not come in contact with the gas flame.

We found, by a considerable amount of experimental work, that the liquid which we have termed Cecolene No. 1, and known chemically in the market as Trichlorethylene, is the most suitable of all the chlorinated solvents for use in this process.

There is a certain amount of diffusion when the vapor comes in contact with the air, but it was found that this diffusion was less

with this liquid than any of the others, and, in spite of the price, was cheaper in the long run, it being borne in mind that this liquid boils at 188°, which is slightly below that of water. It is non-inflammable and non-explosive, so it is almost an ideal liquid to use for this purpose.

The corrosive qualities of this vapor, and particularly when in contact with moisture, made it imperative for us to investigate the material to be used in these tanks quite extensively. Up to the present time, copper has been found to be most suitable for this work. Therefore, our present standard dip tank is built of a copper shell, thoroughly insulated, and covered with galvanized sheet iron as a means of protection. The whole tank is slung in a structural steel frame and is free to expand with temperature changes.

While we show covers on these tanks, they are not required, in view of the fact that the condenser coils hold the vapor at a definite level, and only a mild diffusion of the vapor with the air comes out of the tank.

It has occasionally been brought up that this liquid, or vapor, is toxic; so are alcohol, lacquer thinners and various fumes arising from certain processes which may be found in any factory. Certainly a human being is not going to stick his head into this vapor any more than he would put his hand into hot water. We have found from very close observation, and a considerable amount of experimental work, that if the operator keeps his nose eighteen inches above the vapor level, he need not worry about toxicity or harmful effects.

Of course it is our recommendation that these machines be placed in large, open rooms, or in rooms in which the ventilation is obtained near the floor level, as this diffused vapor drops to the floor immediately.

The length of time required to degrease an object in the Cecolene vapor is variable, but on close observation one will notice that the degreasing is done in the first twenty seconds that the object is in the vapor; after that it is necessary to leave the metal immersed until it comes up to the temperature of the vapor, which may be from thirty seconds to one or two minutes. This is necessary to prevent the liquid being withdrawn with the metal from the vapor, and reduces the loss to a minimum.

In putting this process on the market we, of course, expected to enter the automobile field, but owing to the depression in business

we found other fields more lucrative for the time being. This process has found its way into fifteen (15) different fields of manufacture.

We thought at first the electroplating field was very attractive, but when it was found that the process did not eliminate any of the previous baths that are generally used in electroplating, we quickly gave up the idea and turned our efforts toward other lines. However, it was not long before some of these machines found their way into electroplating plants, and while it was observed that this process does not eliminate any of the previous baths, it does eliminate the grease and oil before the electroplating process, as stated. This keeps the various alkalines, acids and electroplating baths from being contaminated with grease and oil, maintains their proper concentration, and makes the whole electroplating process practically fool-proof, which is a thing that is greatly desired. We are now glad to say that we have a large number of electroplating plants using our degreasing process, and while we do not claim to be competitors of any of the cleaning compound manufacturers, we have found that this process, used in conjunction with theirs, cuts down their service troubles tremendously.

There are a few instances in which the degreaser has supplanted the alkaline solutions, but these are so few and far between that they are hardly worth considering. The application of the degreaser is more or less up to the operator to get the most out of it in connection with his own particular problems, and many have found that an electric cleaner directly after the degreaser makes an ideal combination for the electroplater.

These machines are not only built in the standard size, but have also been built with much larger dimensions and suitable for either the manually operated dip machine or for the conveyor type.

Cost of Operation

Another thing brought out by our survey of the metal cleaning industry is quite significant, and that is the actual cost of cleaning metal, either on the pound basis or on the square foot basis. There seems to be a great mystery about this, as very few have worked out their cleaning costs. With the vapor process, one can very easily determine the cost of degreasing. It is made up of four items: the cost of replacing the liquid, the cost of heating the liquid, the water consumption, and the cost of labor. From our observation,

it would appear that the present method of degreasing runs from $4.00 per ton on up. We have installations of the conveyor type on which the total cost is as low as $1.00 per ton, but for the average metal industry we believe this cost would run between $3.00 and $3.50 per ton, depending entirely upon how fast the degreaser is operated. At any rate our observations and records show that where the positive degreasing of a product is paramount, the vapor process turns out to be about the quickest and cheapest method that can be used.

Aside from the electroplating industry, there are some wide fields for the use of a positive grease remover. One can visualize the enormous field in the metal furniture game, in the repair of automobiles and automobile service trucks, the removal of oil from production machines which contaminates the product, the removal of oil from metal prior to acid etching, the removal of oil between stamping operations in any of the large production plants manufacturing metal ware, etc. We have just recently worked out a process for de-oiling leather by means of the vapor, prior to putting on the patent coating. In fact the fields seem almost unlimited.

We have had some rather odd applications of the vapor degreaser which may be of interest to you, such as the removal of grease from cafeteria trays, the removal of wax from hypodermic syringes, oil from rifle barrels, and oil from clocks and watch works, typewriters and adding machines in the assembled state, and also excess oil from leather belting.

There are also some interesting limitations of the vapor degreaser in which the vapor will not remove the grease and oil from the metals. These are usually cases where the metal is so thin or so light in weight as to come up to the temperature of the vapor almost immediately upon immersion. These are represented by gold foil, tin foil, closely woven jewelry, and some intricate machine parts which are very light; also the grids on radio tubes. We have, however, been able to degrease and clean these parts very satisfactorily by combinations of the liquid and vapor. [Applause.]

MR. ALBERT HIRSCH: Do you use ethelyne trichloride?

MR. WALLACE: Trichlorethelyne.

MR. E. F. LEWIS: Are there any conditions under which the vapor will tarnish or stain the finished metal?

MR. WALLACE: No. Unless there is water present in the vapor. Occasionally, in polished brass, water in the vapor will stain it.

MR. LEWIS: Isn't it true cold metals will carry a vapor film into a solvent?

MR. WALLACE: You mean water film into the solvent?—I hadn't noticed that.

MR. WHITEHEAD: What is the initial cost of an installation? What does it range from?

MR. WALLACE: This process has developed into quite an engineering business, and the fundamental of design is based entirely upon the pounds or tons of metal to be degreased per hour, dropped down to pounds to be degreased per minute, from which we have to go to twenty seconds, because the degreasing action is all done in about the first twenty seconds. Therefore, to give you a cost of any installation, I would have to know your production first.

MR. WHITEHEAD: Well, say on a thousand pounds an hour.

MR. WALLACE: Would that be conveyor type or manually operated?

MR. WHITEHEAD: Manual.

MR. WALLACE: About $600. I might say, in connection with this, that the vapor process is extremely fast. We thought when we started out with this that we would have to increase the size of our tanks, but we soon found that our customers were degreasing upwards of a thousand pounds of metal per hour in a small dip tank, 21″ wide and 48″ long, and in some cases they are running the tanks twenty-four hours a day. In some cases they have increased the number of spray booths in their plant to take the capacity of the tank, which seems to be great for its size.

MR. ALBERT HIRSCH: Isn't that trichlorethylene very expensive, and on a small production basis wouldn't the cost be much higher than what you stated?

MR. WALLACE: It is very expensive as far as chemicals go, about $1.35 per gallon, and in large quantities it can be bought as low as $1.22. But that cost per gallon does not seem to enter into the game as much as we thought it would, on account of our ability to design the tank and the equipment to cut down the diffusion loss. The diffusion loss from this vapor is at the rate of .046 of a pound per square foot of vapor surface in contact with the air per hour.

MR. HIRSCH: Couldn't that be reasoned out another way,—the cost of the charge in there, and how long that charge would last?

MR. WALLACE: Not very well. In our standard tank, which I said was 21″ wide and 48″ long, in which you can put through a

thousand pounds per hour, you will have a loss of about three gallons of that liquid in eight to nine hours' time, in average operation.

MR. HUTCHINSON: I might say that we used one of those degreasers the past year and a half or two years. I might mention one particular use we used it for, and that is cleaning grease from parts that have been pickled, of vitreous enamel. That would hardly seem possible, but the machine does that work. We find that steel parts which are not finished up in the next two or three days will rust. Have you found that to be the case with steel parts allowed to remain in stock a few days or weeks before finishing?

MR. WALLACE: Personally, I believe the finishing of metal ought to be done immediately after it is degreased; but I do know of a number of cases in which the metal had not rusted for a long time after, say five or six weeks after it has come out of the vapor bath.

MR. C. P. KUELL: About two years ago we tried your method on buffed work, nickel-plated work ready for packing. We find quite a job in cleaning off such parts as embossed work, and we thought that it might be a good idea to use your degreasing process for cleaning off this greasy buffed material, but after using it, putting it through your outfit, there seemed to remain a dry film. Also, the dirt was not removed with the grease; it seemed to remain. Have you been able to produce anything in that line?

MR. WALLACE: Of course we advertise that this is just a positive grease remover; that is all it will remove, grease and oil. Any of the oils, with the exception of the water soluble oils. The dust is left on there in the form of residue. It comes off very easily. But in some cases our customers have been able to remove that by first flushing the part in cold liquid, cold trichlorethylene. First put it in the vapor and then slush it in the cold liquid, and then back in the vapor again to dry, and in some cases all that dust has been removed very satisfactorily.

MR. KUELL: And the work has been fit to ship in that condition?

MR. WALLACE: Yes, but I won't say it will do it every time. We can only guarantee to take the grease off. But as I say, our customers have put the machine to very, very strange uses. In some cases we are not even allowed to find out just how they have worked out their difficulties, but it has been a godsend to a great many concerns.

MR. MCKAY: Mr. Chairman, I think I have something of interest to most of the gentlemen here this afternoon, in our discussion of the porosity of chromium plate along with this subject of cleaning. We have been looking this afternoon at these diagrams of the porosity of chromium plate on different metals, and we see, for example, how we have less porosity on nickel than we have on other metals, such as copper, brass and steel. We generally think, in chromium-plating, that we have a necessity of undercoating chromium plate with copper and nickel, because of the fact that chromium is porous, and we need copper and nickel for rust protection. On one side of this story is perhaps the fact that, chromium-plating for appearance, we often have to consider the fact that it costs so much more to polish steel for appearance than it does, for example, to put a fairly good finish on steel and then put a deposit of copper and nickel on the steel which will buff and flow easily so we can have a very smooth surface before chromium-plating. This smooth surface before the chromium plate is one which will take a non-porous plate very easily. For example, in these diagrams which Dr. Blum showed us, showing the lower porosity of chromium on nickel than the other metals, my thought on that is that one explanation for it is due to the fact that we have a very smooth surface in nickel which perhaps we cannot obtain in steel. In the diagrams of copper and brass, although they are somewhat easier to polish than steel, here our difficulty may be due to the fact that we have a certain amount of solution pressure when we put copper or nickel in chromic acid. My thought is that in chromium-plating these metals, if we have a perfectly smooth surface to start on, we do not have that bridging over which we have on roughly polished steel.

Now there is, in the Pittsburgh district, an organization which I am at liberty to discuss, the Pittsburgh Plate Glass Co., who has been a leader in the work on chromium plate for wear-resisting and corrosion-resisting applications, and they have done a lot of work on the cleaning of steel before chromium-plating, and they have found that with a new method of degassification, or "outgassing," as they call it, they have been able with this thin plate of chromium, in the range that we discussed this afternoon, of two to four hundred-thousandths, to get rust protection which is similar perhaps to thirty or thirty-five minutes of Udylite. Corrosion protection which will withstand the action of two hours in salt spray.

I think this may be interesting to the men in the Electro-Platers Society. I think one field which has generally been closed to chromium-platers, unfortunately, is the fact that chromium has generally been thought of as being a very porous plate. Unfortunately, purchasing agents have the same idea, but I believe that some of the research which will be done in the future must of necessity be done on the pre-treatment of metals, particularly such as steel and brass, which will enable us to chromium plate and give us absolute corrosion protection.

BRANCH NEWS

ANDERSON BRANCH

The meeting was called to order at 8:00 p.m., September 14, 1931. Roll call of officers showed only Mr. Kaegi absent. Minutes of the previous meeting were read and approved.

A bill from the Short Printing Company was approved and ordered paid.

Letters from Messrs. Fraine, Gilbertson and Emmert were read to the branch.

Mr. Cleaver urged all members to push the sale of tickets for the radio raffle.

It was moved, seconded and passed that the raffle be held at our next meeting, October 5, and that the committee be given full authority to select the radio.

It was suggested that, in the future, all names sent to the secretary by the Supreme Secretary or others outside the local branch be turned over to the membership committee to follow up.

There was considerable discussion as to the advisability of conducting a class this winter, and it was decided to refer the matter to a committee which Mr. Cleaver would appoint.

The meeting was then turned over to Dr. Cotton, who talked and led a discussion on the principles of cleaning metals. Notes were distributed to those present.

The meeting adjourned at 9:30 p.m.

The meeting was called to order at 8:15 p.m., October 5, 1931, in the boys' assembly room of the Anderson Y.M.C.A. with 25 members and guests present. Roll call of officers showed all present.

Minutes of the meeting of September 14, 1931, were presented and approved.

A letter from Mr. H. A. Gilbertson submitting the dates June 20, 21, 22 and 23, 1931, as the time for our next convention at Philadelphia was read. The secretary was instructed to reply that the dates submitted were satisfactory if accepted by the other branches, but that Anderson Branch favored an earlier date in order to avoid the hot weather.

An invoice from the General Motors Radio Corporation was read and approved. Mr. Onksen, chairman of the committee to raise money for the Research Fund, then took charge and proceeded with the radio raffle.

After careful consideration, the committee had decided upon a raffle as the best method of raising the money Anderson Branch had pledged to the Research Fund. A radio having been decided on as the logical thing to raffle, a letter was sent to Mr. Emmert, president of General Motors Radio Corporation, who gave us a nice discount on the set which had been selected.

Tickets were sold at 25c each, or a book of five for $1.00. At the meeting, before starting the raffle proper, Mr. Onksen raffled off several books of tickets, selling enough ten-cent (10c) chances to make up the face value of the books. He then proceeded with the raffle proper.

Since the name Anderson contained eight letters, there were eight numbers drawn from the large pasteboard raffle box, one of our guests doing the drawing. Then, amid tremors of excitement and much wise-cracking, the final drawing was conducted, the winning ticket being drawn from among the eight previously selected. The winner was Herman Staggenburg, a member of the Anderson Branch and supervisor of plating at Delco-Remy. The treasurer announced that the raffle had been a financial success and that a report would be presented at the next meeting.

Mr. A. W. Hutton, of the Cowles Detergent Company, then obliged with a short talk on "Colloidal Cleaners," which was well received and drew many questions.

The president announced that he would appoint a committee to make recommendations as to the branch's educational program for the coming year.

It was moved and passed that the branch have a stag party within the current month. The president was to appoint a committee.

The secretary was instructed to write Dr. Fink inquiring about special membership rates in the Electrochemical Society for A. E. S. members.

The meeting adjourned at 10:10 p.m.

* * * *

The meeting November 2, 1931, was called to order at 8:10 p.m. with 17 members present. Roll call of officers showed Messrs. Kaegi and Phelps absent. Minutes of the meeting of October 5 were read and approved.

Letters from Mr. Hay and Mr. Gilbertson were read; as were letters to Mr. Gilbertson and Mr. Fink.

The application of Gail Eldridge, of Indianapolis, was read to the branch and referred to a committee. Mr. Cleaver announced that an educational committee consisting of Messrs. Cotton, Cheney, Kaegi, Phelps, Wagner, Onksen and Sanders had been appointed October 12, and was ready to report. Dr. Cotton made the committee's report, whereby it was recommended:

(1) To have *no* class in chemical analysis or related subjects for outsiders this year.

(2) To have two meetings per month, one to be purely educational, this to consist for the present of Dr. Cotton's course in electroplating; and the other meeting to include business, outside speaker, question box, etc.

It was moved, seconded and passed that the foregoing recommendations be accepted. By a vote it was decided to change the regular meeting hour to 7:30 p.m. hereafter. The next meeting night was set for November 16.

Mr. Cleaver announced that he would like to have the educational committee continue in the future as a program committee.

Mr. Shockley suggested that an effort be made to secure more publicity in the newspapers. It was suggested that meetings be announced in the weekly calendar in the newspapers. The secretary was instructed to take care of this.

The meeting adjourned at 9:45 p.m.

R. M. WAGNER, *Secretary-Treasurer.*

PROVIDENCE-ATTLEBORO BRANCH

Meeting November 6 at Crown Hotel. The president and vice-president were absent.

The meeting assumed the round table style. The first question was: Given three large plating tanks, with chrome solution in No. 1, copper sol. in No. 2, and nickel solution in No. 3. A 5000 6-volt amp. generator, connected, a Field rheostat, and a 1200 amp. rheostat in the line, on the chrome tank. Garrick asked what to do after enough work had been put in the chrome tank to require all of the 1200 amps. Mr. Weisberg said that he would have a double throw switch and cut out the rheostat, that the work would take care of the amperes, and as the other tanks require a lower voltage the Field rheostat could be used to adjust the current. However, this started quite a little argument, and it was not very clear to the writer what should be done; apparently there is some difference of opinion on this point. We would like to hear from any member who can supply, by diagram or otherwise, a clear, definite method of handling this problem.

The next question was: Is rhodium-plating a durable and satisfactory finish? After considerable discussion it was agreed that, due to the ease with which it can be deposited, on work even where it is quite closely bunched, the short time required, the exceptional spreading quality, i.e., the very small amount of metal required to cover a given area, the high lustre and non-tarnishing quality, it is the best white finish yet for jewelry and small novelties; but that for larger goods, such as tableware, it has not proven satisfactory.

The next question was: Which form of meeting is most suitable for the branch, i.e., to have speakers, to have a class, or the round table talks? After some discussion the majority seemed to be in favor of the round table talks.

Mr. Weisberg said that he thought we would derive more benefit from this style of meeting.

We were pleased to have Mr. Weisberg with us and hope he will continue.

Adjourned 10:30.

JOHN ANDREWS, *Secretary.*

HARTFORD-CONNECTICUT VALLEY BRANCH

The Hartford-Connecticut Valley Branch, A. E. S., held its regular meeting on Monday evening, October 26, at the Springfield Chamber of Commerce, Springfield, Mass.

The meeting was opened at 8:30 p.m. with President Fleming in the chair. Minutes of the previous meeting were read and accepted. No bills were reported. All communications were read and placed on file. The convention dates of June 20, 21, 22, 23 for 1932 were voted upon with favor. Other communications were tabled until our next meeting. One application was received and voted to take the usual course. The applicant was Mr. Joseph St. Pierre of the E. I. Ingraham Co. of Bristol, Conn.

As we had no speaker for the evening, we received with pleasure the report of delegate Mr. Kennedy of the happenings of the 1931 Convention. Bill gave us an interesting account of what took place, and how.

The chemistry class has already started advance work on solution analysis with an attendance of about sixteen members. The class is held, as of last year, at the Indian Motorcycle Plant, where Mr. T. J. Murray conducts a job shop.

The meeting was attended by only ten members, as most of the Springfield boys were at the platers' class that night.

The meeting adjourned at 10:30 p.m.

V. E. GRANT, *Secretary.*

BOSTON BRANCH

Boston Branch met Thursday, the 5th, at the American House with President Gale in the chair.

The minutes of the previous meeting were read and approved.

Communications and bills read and placed on file.

Reports of committees, the chairman of the chemistry class made a report that the class will get going by the first of the month and that they expect to have more members this year than last year, and that we will have the same instructor, Mr. Cahill.

One application was received for membership and one new member was elected to membership.

The librarian, Mr. Mackie, held his first question box, and he answered the questions so well that it is the hope of the branch to have the answers appear in THE REVIEW soon.

Mr. Mackie gave his talk on "The Electroplating of Band Instruments in Gold and Silver." This was a very interesting talk, explaining how this work is done from the start to the finish of the instrument. Afterwards he answered all questions, and the branch voted him a vote of thanks for his very interesting talk.

The librarian states that the subject for the next meeting will be a talk on cleaners to be given by Mr. Eric Rylander, a member of our own branch.

The meeting adjourned at 10:45 p.m.

Yours truly,

A. W. GARRETT, *Secretary.*

DAYTON BRANCH

The regular monthly meeting of the Dayton Branch was held Saturday evening, November 7, at the local Y. M. C. A., with our vice-president, Mr. William Brandt, presiding.

The regular business of the branch included the reading of the minutes of the previous meeting and their adoption; also reading of an official communication in regard to contributions to the research fund. Mr. Fraine, who is a member of Dayton Branch and who has been appointed treasurer of the research fund, reported that contributions were being received from numerous branches.

With the regular business of the branch taken care of, the meeting was opened for discussion. Mr. Jno. King was present at the meeting, and also told of the special machinery for the weaving and sizing of the splits that make up the barrel. Mr. King's talk was enthusiastically received and a lively discussion followed as to the merits of the various types of plating barrels.

The question of gold gilding was brought up at this meeting, and the remarks by Mr. Fraine on the methods and procedure of this process were indeed very interesting.

The members of the chemical control class have again swung into action and are holding their weekly class meetings with the usual amount of interest and enthusiasm.

It is hoped that during the coming winter months a number of interesting papers will be presented and read at the regular monthly meetings of the branch.

WARD PROTSMAN, *Recording Secretary.*

LOS ANGELES BRANCH

The regular monthly meeting of this branch was held October 14 at the Chamber of Commerce Building. Communications were read and ordered filed; bills ordered paid.

A report of the branch's picnic held September 2 at Manhattan Beach was given by the committee, Rushton, Thornton and Rynkofs.

Word was received that Brother Kyle is in the hospital, having been stricken with nervous prostration. A motion was made to send Brother Kyle a letter expressing the membership's hopes for a speedy recovery. Mr. Kyle is at present associated with A. J. Lynch Co.

Earl Coffin arranged a snappy program for the educational feature of the meeting. The questions were as follows:

Question—What kind of an acid dip is best for nickel-plating—sulphuric or muriatic?

Answer—Use muriatic 10% to 25%.

Question—What causes brass to blister in cyanide copper? The steel plates O.K., but the brass casting seemed to blister.

Answer—Cut down metal content.

After the questions were disposed of the following subjects were discussed:

Low pH nickel-plating.

Rhodium-plating, introduced for the first time to this branch, a subject which brought out some interesting arguments comparing rhodium-plating and chromium-plating.

Brother Boeck of the Oakite Products Inc. brought his projector up to the meeting and showed the motion picture film of the recent Convention received through the courtesy of the Rochester Branch, followed with two reels of comedy pictures, which was enjoyed, and a rising vote of thanks was extended the Rochester Branch for the use of same.

The meeting was exceptionally well attended and adjourned at 11:00 p.m.

M. D. RYNKOFS, *Secretary.*

CLEVELAND BRANCH

The Cleveland Branch held its monthly meeting on Saturday evening, November 7, President E. Steen Thompson presiding.

The Chair introduced Mr. J. S. Nachtman, our new member from Warren, O. The minutes of the October meeting were approved after corrections.

Mr. Zadowski, chairman of the committee in charge of arrangements for a chemistry class, gave a report.

A motion to accept the report was passed. The class will meet each Thursday evening at 7 p.m., at Case School of Applied Science. Dr. Prutton will instruct the class. The lessons are to be copied so that out-of-town members can receive them. The branch is to pay the tuition fee so that members who are out of work can attend.

A motion was carried approving the Convention dates of June 20, 21, 22 and 23, 1932.

Our librarian not being present, the Chair called on Mr. Jacob Hay and Mr. Nachtman for a few words. Both responded in a splendid manner.

A motion to adjourn was carried at 10 p.m.

PAUL STAMM, *Secretary.*

CHICAGO BRANCH

The regular monthly meeting of Chicago Branch was held November 14, 1931, at the Atlantic Hotel. The meeting was called to order with President J. C. Kretschmer presiding. All other officers present.

Mr. H. A. Gilbertson, chairman of the chemistry class, reported favorably. This class will commence in January.

Mr. H. W. Faint will be our instructor.

Mr. C. E. Clindinin, chairman of the Banquet and Educational Committee, reported progress.

One application was received for active membership, Gerald Edwards Tucker of A. & J. Kitchen Tool Co., Chicago. Mr. Fred A. Schneider was

elected to active membership in the Society. The meeting was turned over to our librarian, Mr. O. E. Servis, who found the following questions in the box:

Question—Are cadmium anodes liable to deposit on a steel tank?

Answer—All members advised to insulate tank.

Question—What is a good strip for chrome plate on highly polished and nickel-plated parts? Do not want to ruin nickel plate.

Answer—Alkaline strip and reverse current and be careful to neutralize work or a hot sulphuric dip 180-200 10% solution.

Question—Is it necessary to clean nickel before chrome-plating?

Answer—No objection in cleaning work.

Question—A salt spray resisting bright nickel, wanted a good formula.

Answer—All members were very interested in this question. Would like to hear from other branches.

Question—We are tin-plating cone-shaped cutters. They have a bead turned over at the bottom and this bead is causing trouble. They are pickled in sulphuric acid and hardened in cyanide. We have tried to stop this discoloring from the seeping of the solution.

Answer—All members thought your trouble is to remove the sulphuric acid from the bead and not the fault of the tin solution. Try a 5% acetic dip.

E. G. Stenberg, *Secretary and Treasurer.*

DETROIT BRANCH

Detroit Branch held its regular monthly meeting November 6 at the Statler Hotel, President Jos. H. Hansjosten presiding. After the regular order of business a paper was read by our President, the title of which was "Shall we Extend Our Research?" It was well received and he was given a rising vote of thanks. The contents of this paper were published in the November issue of The Review. We earnestly hope that it will bring up a general discussion, as its contents are of vital importance to the craft. The branch was also successful in the organization of two plater classes, one at the Wilbur Wright School, the other at the Rex Laboratory. The speaker for the December meeting will be Karl Soderberg, whose subject will be announced later. Meeting closed with the customary question and answer box by Mr. B. F. Lewis.

Question—What is the best way to strip cadmium off of die castings?

Answer—Ammonium nitrate solution, 16 oz. per gal.

Question—How has nickel peeling under chrome been overcome?

Answer—By careful preparation of the base metal before nickel-plating, and by the use of warm nickel baths for heavy, soft nickel deposits.

Question—How is it a pH of 1 does not pit and a pH of 2 and 3 will pit?

Answer—Probably because the higher acidity of the pH1 keeps the impurities in solution, so that they are plated out after the bath has been operated for some time. It should be borne in mind that while pH1 and pH3 are not far apart numerically, the former actually represents 1000 times as great a concentration of hydrogen ions as the latter.

Question—What solution would you recommend which will produce a thick tin plate (over .0002") at reasonable current densities (over 10 amps./sq. ft.) without powdery plate?

Answer—See formula in Sizelove's Guidebook (Metal Industry) and add 4 oz. gal. sodium cyanide.

Question—Has anyone ever plated bright tin?

Answer—Use the usual meal tin bath cold.

Question—How may the deposit from a die-cast nickel solution be made softer?

Answer—Run the temperature up to 80° F. Keep the boric acid content at 4 ounces per gal. If hardness is due to organic matter, oxidize with potassium permanganate. The amount to use may be determined by titrating a measured sample with a permanganate solution of known concentration.

Question—Is it necessary to plate chromium 15 to 30 minutes?

Answer—This is done on brass and steel without undercoatings, but is not recommended for durability. See Bureau of Standards Research Bulletin No. 368, "Porosity of Electrodeposited Chromium."

CHAS. M. PHILLIPS, *Secretary and Treasurer.*

WATERBURY BRANCH

The regular monthly meeting of Waterbury Branch was held Friday evening, Nov. 13, and was presided over by President Leroy Miller. A good sized audience was present to hear Arthur W. Tracy of the American Brass Co. technical department deliver a talk on "The Corrosion of Metals." The speaker accompanied his address with lantern slides and was assisted by Ellsworth Candee. A rising vote of thanks was extended the speaker for his instructive talk. Assistant Librarian E. Candee reported progress in the matter of arranging for a chemical class. Had been given to understand that the laboratory of the Wilby High School would be available to the branch members. The attention of the members was called to the request of Chairman Hay of the Research Committee that they furnish the committee with the names and addresses of prospects, manufacturers and jobbing concerns that might contribute to the fund. Communication from the Philadelphia Branch was read, extending an invitation to attend their annual meeting and banquet. The Entertainment Committee announced that through the kindness of the American Brass Co., at the next meeting, Friday, December 11, they would be able to present the picture, "From Mine to Consumer," the story of Anaconda. This is a Pathescope production and will undoubtedly prove to be a big drawing card.

W. F. GUILFOILE, *Secretary,*

MILWAUKEE BRANCH

The regular meeting of Milwaukee Branch, A. E. S., was held o November 12, 1931, at Lipps Hall, 3rd and W. Highland Avenue. The meeting was called to order by President M. Nishwitz, all officers being present. Our

sergeant-at-arms, Dan Wittig, was unable to be at the meeting, due to too much volley ball, which put Dan on the shelf for a few weeks, as Dan never misses a meeting unless he's unable to walk. Milwaukee Branch's chemistry class is going along at full speed. We have a very able instructor, Mr. Colein, who is just working along the line of Dan's semi-definite plan, which is just what we want for our work. Our educational meeting was well attended. The film from "Mine to Consumer," which was presented by the American Brass Co., was very interesting. Librarian Henry Binder has made arrangements with Mr. Hermenson to give us a talk on low pH at our educational meeting in January, 1932.

With kindest regards I remain,

Yours truly,

FRANK J. MARX, *Secretary and Treasurer.*

NEWARK BRANCH

The regular meeting of the Newark Branch, A. E. S., with President William Harrison, there being 29 members present.

Minutes of previous meeting were read and approved.

Chairman Fletcher of the Card Party Committee announced everything in readiness for the card party on November 17, 1931, at Foresters' Hall, Irvington, N. J.

Under good and welfare the platers' class of the Newark Branch gave a good account of themselves, a splendid showing of green verd on copper and brass immersion dip. This class, who worked in groups of three, have tried to date, over a period of eight nights, 21 different solutions and formulas. Samples were shown and the good and bad results were discussed. Real progress was made in these solutions, and it is the hope of its instructor to continue to keep going.

Yours very truly,

GEORGE REUTER, *Secretary and Treasurer.*

PHILADELPHIA BRANCH

The regular monthly meeting was held at the Harrison Laboratory, U. of P., Friday night, November 6, President Harry Snyder presiding.

The application of Morris Walsh was received and referred to the Board of Managers for investigation.

The Board of Managers reported favorably on the applications of Albert E. Shaffer, 1328 N. 13th St., Philadelphia, Pa., and Roland L. Hoenstine, Mt. Wolf, Penna., and they were elected to active membership.

It was with sincere regrets that President Snyder announced the death of J. W. Dougherty, and the branch has lost a staunch friend and member.

The meeting was then turned over to the Educational Committee, who had a motion picture story waiting for us, "From Mine to Consumer," and which was greatly appreciated by all.

President Harry Snyder has set aside the next meeting, December 4, for a round table discussion of events during the past year and what we should do during the coming year, allowing plenty of time for each member to discuss any and all phases of the research work done by our research associate at the Bureau of Standards, Washington, D. C. Also all suggestions as to building up the Research Fund will be considered and discussed.

Jos. E. UNDERWOOD, *Secretary.*

ROCHESTER BRANCH

Regular monthly meeting was called to order by Vice-President Elster.

There was a very large attendance and we were all disappointed, as we expected to have a speaker on compositions, but he was unable to be with us.

Mr. Lux gave an outline of what he expected Rochester Branch to do in the school this year, and all who are interested are welcome, as Mr. Lux says it is Rochester members' school and he will do all he can to make it a success.

Mr. J. J. Desmond was with us and gave us a very interesting talk on lacquers.

Secretary was instructed to send $50 to the Research, and Rochester Branch voted No on the $2 per member assessment. Meeting was adjourned at 10:30 p.m.

CHAS. GRIFFIN, *Secretary.*

HARTFORD-CONNECTICUT VALLEY BRANCH

The Hartford-Connecticut Valley Branch held its regular monthly meeting on Monday evening, November 23, at the Hartford Chamber of Commerce rooms, Hartford, Conn.

The meeting was called to order at 8:30 p.m. with President Fleming in the chair. Minutes of the previous meeting were read and accepted. No bills were presented, neither were there any communications to be read.

One applicant, Mr. Joseph St. Pierre, was elected as an active member.

It was voted to hold our December meeting on the 21st instead of the 28th, due to the Christmas holidays.

No speaker was listed, so the time was spent in discussing some difficult problems which two of the members presented and which were giving them some difficulty.

The meeting was attended by only fourteen members and visitors and was adjourned at 10 p.m.

V. E. GRANT, *Secretary.*

APPLICATIONS

WILLIAM JONES, 263 Havre Street, East Boston, Mass.....Boston
WALLACE B. RIDEOUT, 54 Canal Street, Medford, Mass.....Boston
F. A. SCHNEIDER, 6431 S. Emerald Avenue, Chicago, Illinois.....Chicago
T. W. KIRBY, 19915 Litchfield Avenue, Detroit, Michigan (Assoc.)....Detroit
PATRICK H. O'CONNELL, 785 Monroe Street, Brooklyn, N. Y.....New York
G. E. TUCKER, 5059 N. Damen Ave., Chicago, Ill.....Chicago

ELECTIONS

WILLIAM JONES, 263 Havre Street, East Boston, Mass.....Boston
WALLACE B. RIDEOUT, 54 Canal Street, Medford, Mass.....Boston
T. W. KIRBY, 19915 Litchfield Avenue, Detroit, Michigan (Assoc.)....Detroit
PATRICK H. O'CONNELL, 785 Monroe Street, Brooklyn, N. Y.....New York

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SUSPENSIONS

MR. WM. L. LEWIS, c/o Josten's Inc., Owatonna, Minn.....Chicago
JAMES LENNOX, 5840 Maxwell Avenue, Detroit, Michigan.....Detroit
JULES ROHDY, 3770 Rohns Avenue, Detroit, Michigan.....Detroit

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DEATHS

MR. STEPHAN VERFURTH, 3172 N. Richards St., Milwaukee, Wis....Milwaukee

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REINSTATEMENTS

E. COLES, 66 August Ave., Toronto, Canada.....Toronto

RESEARCH COMMITTEE

Chairman, JACOB HAY.....6920 Ottawa Ave., Chicago, Ill.

Sec.-Treas., WALTER FRAINE.....507 Grand Ave., Dayton, Ohio

S. E. HEDDEN.....227 Fifth Ave., Aspinwall, Penn.

WILLIAM F. GUILFOILE.....14 Oakland St., Waterbury, Conn.

DAN WITTIG.....1221 N. Third St., Milwaukee, Wis.

DR. WILLIAM BLUM.....Bureau of Standards, Washington, D. C.

MR. OSCAR SERVIS.....5305 Warner Ave., Chicago, Ill.

MR. N. E. ZADOWSKI.....1383 W. 65th St., Cleveland, Ohio

MR. W. S. BARROWS.....628 Dovercourt Road, Toronto, Canada

C. F. NIXON.....Ternstedt Manufacturing Co., Detroit

DR. H. S. LUKENS.....University of Pennsylvania, Philadelphia, Pa.

BUREAU OF EDUCATION

Chairman, MR. ALBERT HIRSCH.....1945 Airdrie St., Philadelphia

Branch Representatives:

Chicago Branch.....HAROLD FAINT

Waterbury Branch.....ELLSWORTH CANDEE

Los Angeles Branch.....M. D. RYNKOFS

New York Branch.....HENRY LEVINE

Philadelphia Branch.....DR. A. K. GRAHAM

Baltimore-Washington Branch.....DR. WM. BLUM

Cleveland Branch.....J. C. SINGLER

Hartford-Connecticut Valley.....RAY O'CONNOR

Worcester Branch.....M. H. FROMMANN

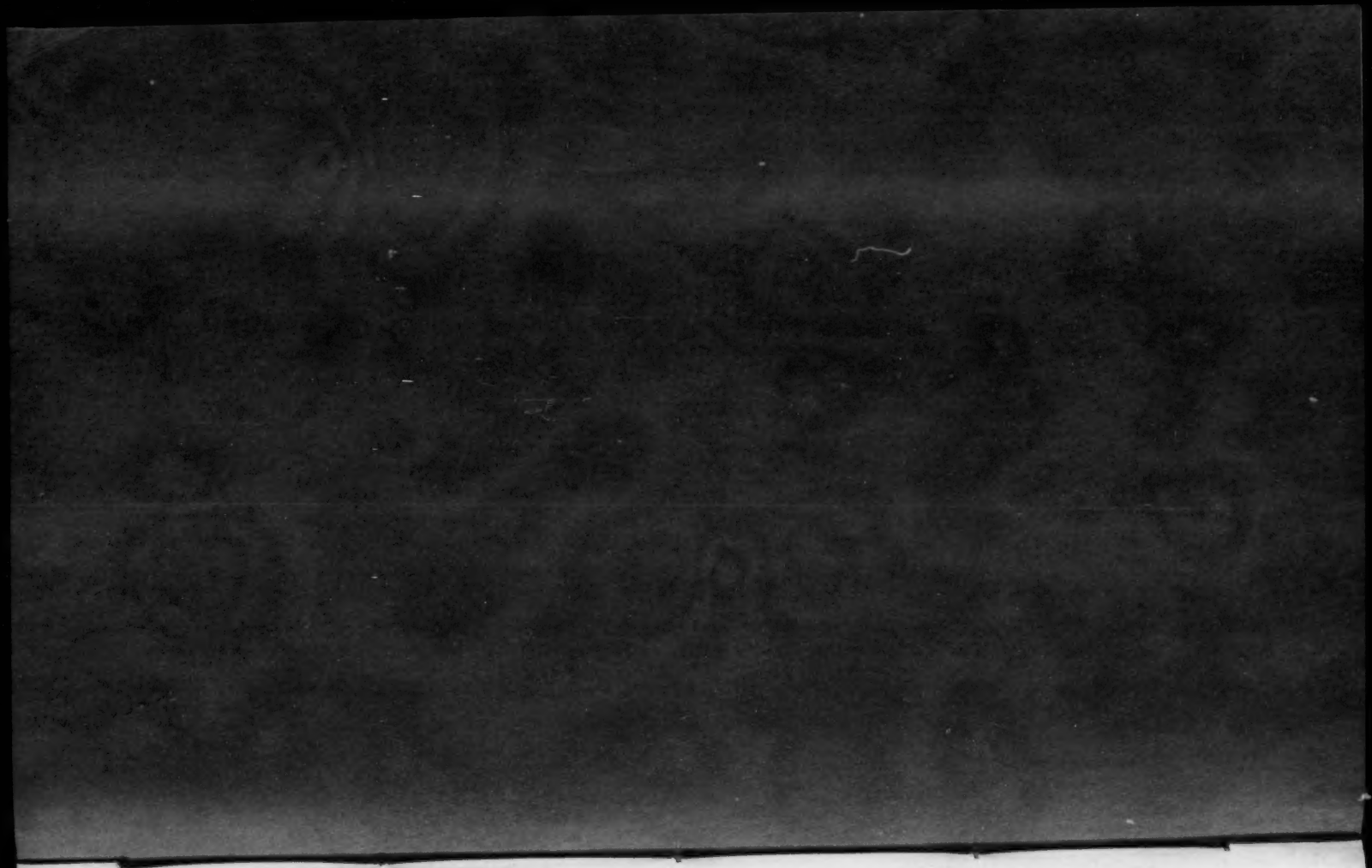
Toronto Branch.....C. KEMESH

Anderson Branch.....D. A. COTTON

Newark Branch.....PAUL A. OLDAM

Other Branch Representatives will be printed as received.

APR 1934



ANDERSON BRANCH

Meets first Monday of every month at 7:30 p.m. at the Anderson, Indiana, Y. M. C. A. R. M. Wagner, Secretary-Treasurer, 28 W. 12th St., Anderson, Indiana.

BALTIMORE-WASHINGTON

Meets in Enoch Pratt Library, Calhoun and Hollis Sts. Irvin H. Hahn, Secretary, 207 S. Sharp St., Baltimore, Maryland.

BOSTON

Meets at American House, Boston, Mass. First Thursday each month. Secretary, A. W. Garrett, 45 King St., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month at Chamber of Commerce Rooms, Stratfield Hotel. Secretary, T. H. Chamberlain, 359 Orange St., New Haven, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p.m., Atlantic Hotel, 316 S. Clark St., Secretary, E. C. Stenberg, 2209 N. Kenneth Ave., Chicago, Ill.

CINCINNATI

Meets every Thursday, 7:30 p.m., at Vocational Training School, Spring and Liberty Sts. Secretary, Al Yeager, 3021 Sherman Ave., Norwood, Ohio.

CLEVELAND

Meets first Saturday of each month at Hotel Winton. Paul R. Stamm, Secretary, 947 Elbon Road, Cleveland Heights, Ohio.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Ward Protsman, 141 Westwood Ave., Dayton, Ohio.

DETROIT

Meets the first Friday of each month at the Hotel Statler, Louis H. Room. Secretary, Chas. M. Phillips, 12935 Hickory Ave., Detroit, Mich.

GRAND RAPIDS

Meets second Friday of each month at 528 Lake Michigan Drive, N. W. Secretary, Jacob Van Dyke, 1361 Union Ave., N. E., Grand Rapids, Mich.

HARTFORD-CONNECTICUT VALLEY

Meets fourth Monday in each month alternately at the Chamber of Commerce, 815 Main St., Hartford, and the Chamber of Commerce, 134 Chestnut St., Springfield. Secretary, Vernon Grant, 32 Jennings Road, Bristol, Conn.

INDIANAPOLIS

Meets second Saturday of each month at Hotel Denison. Secretary, Louis Moritz, 1729 Union St., Indianapolis, Ind.

LOS ANGELES

Meets second Wednesday of each month at the Chamber of Commerce Bldg., 9th floor, 1151 S. Broadway. Secretary, M. D. Rynkofs, 1354 W. 28th St., Los Angeles, Calif.

MILWAUKEE

Meets second and fourth Thursdays of each month at Cor. 3rd and Highland Ave., Frank J. Matz, 1431 W. Cherry St., Milwaukee, Wis.

MONTREAL

Meets second and fourth Friday of each month at 1437 Aylmer St., Montreal, Quebec, Canada, where the Secy-Treas., Mr. Charles Doherty, can be found at any time.

NEWARK

Meets first and third Fridays of each month at Franklin Hall, 41 Franklin St., Newark, N. J., at 8 p.m. Secretary-Treasurer, Geo. Ruster, P. O. Box 261, Newark, N. J.

NEW YORK

Meets second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary-Treasurer, J. E. Sterling, 2531 48th St., Astoria, L. I.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, J. E. Underwood, 227 N. 10th St., Camden, N. J.

PITTSBURGH

Meets first Friday of each month at 8 p.m., at downtown branch, Y. M. C. A. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third week of each month. Notice by card. J. H. Andrews, Secretary, 19 Rosedale St., Providence, R. I.

ROCHESTER

Meets third Friday of each month at Hotel Seneca. Secretary, Chas. Griffin, 34 Gurson Ave., Rochester, N. Y.

SAN FRANCISCO BRANCH

Meets at Plaza Hotel, San Francisco. Secretary, H. W. McKibben, 939 Tehama St., San Francisco, Cal.

ST. LOUIS

Meets second Friday of each month at the Plant of the Lassaleo Co., 2823 LaSalle St. Secretary, C. T. McGinley, 5314 Fairham Ave., University City, Mo.

TOLEDO

Meets first Thursday of each month at Toledo Secor Hotel, Cherry and Page Sts. James M. Lee, Secretary, Barker Street, Fremont, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Forestery Hall, 82 College St., Room No. 2. Secretary, H. W. Graham, 102 Robina Ave., Toronto, Canada.

WATERBURY

Meets second Friday of the month at Engineers Hall, No. 11 East Main Street. Wm. P. Gallotte, Secretary, P. O. Box 961, Waterbury, Conn.

WORCESTER

Meets Directors' Room, Chamber of Commerce, Worcester, Mass. Roger H. Bryant, Secretary, 94 Grove St., Worcester, Mass.